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Notice of Allowability	Application No.	Applicant(s)
	10/737,404	DAHLSTEDT ET AL.
	Examiner	Art Unit
	Philip Wang	2191

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *5/29/2007*.

2. ☒ The allowed claim(s) is/are *1-75*.

3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
   a) ☐ All b) ☐ Some* c) ☐ None of the:
      1. ☐ Certified copies of the priority documents have been received.
      2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
      3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
   (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

DETAILED ACTION

1. This office action is in response to amendment filed on 5/29/2007.

2. The objection to the specification is withdrawn in view of the Applicant's amendment to the Specification.

3. The objection to the drawings is withdrawn in view of the Applicant's amendment to the drawings.

4. The 35 U.S.C. § 112 rejections of claims 1-75 are withdrawn in view of the Applicant's amendment to the claims.

5. Per Applicant's request, claims 1, 3, 6, 8, 10, 13, 15, 17, 20, 22, 24, 27, 29, 31, 34, 36, 38, 41, 43, 44, 49, 50, 55, 56, 61, 62, 67, 71, and 72 have been amended and claims 13-14 are new claims entered.

6. Claims 1-75 are allowed.

EXAMINER'S AMENDMENT

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in communication with Julie Daniels Missud (Reg. No. 51,330) on August 2, 2007 to obviate any potential issues and to put the claims in condition for allowance.

7. The application has been amended as follows:

In the claims:

1. (Currently amended) A system for determining potential memory leaks in a runtime environment, said run-time environment including a virtual machine ~~and a memory space for storing objects~~, the system comprising:

a memory for storing objects;

an object temperature analyzer that accepts as input from a system developer a value for a limiting time,

wherein the object temperature analyzer determines for each object whether the object has persisted in the memory without being accessed or referenced for a length of time greater than the limiting time, wherein if the length of time is greater than the limiting time the object temperature analyzer sets the status of the object to cold, and if the length of time is less than the limiting time the object temperature analyzer sets the status of the object to warm; and

wherein the object temperature analyzer determines links from any of the warm objects to any of the cold objects; and[[,]]

a report mechanism that reports information about the links, for use by the system developer in determining potential memory leaks.

7. (Currently amended) The system of claim 1 wherein the objects are not moved in the memory when clustered.

8. (Currently amended) A system for determining potential memory leaks in a runtime environment, said run-time environment including a virtual machine ~~and a memory space for storing objects~~, the system comprising:

a memory for storing objects;

means for accepting as input from a system developer a value for a limiting time;

means for determining for each object whether the object has persisted in the memory without being accessed or referenced for a length of time greater than the limiting time, wherein if the length of time is greater than the limiting time, setting the status of the object to cold, and if the length of time is less than the limiting time, setting the status of the object to warm;

means for determining links from any of the warm objects to any of the cold objects; and[[,]]

means for reporting information about the links for use by the system developer

in determining potential memory leaks.

14. (Currently amended) The system of claim 8 wherein the objects are not moved in the memory when clustered.

15. (Currently amended) A method for determining potential memory leaks in a runtime environment, said run-time environment including a virtual machine and a memory ~~space~~ for storing objects, the method comprising the steps of:

accepting as input from a system developer a value for a limiting time;

determining for each object whether the object has persisted in the memory without being accessed or referenced for a length of time greater than the limiting time, wherein if the length of time is greater than the limiting time, setting the status of the object to cold, and if the length of time is less than the limiting time, setting the status of the object to warm;

determining links from any of the warm objects to any of the cold objects; and[[,]] reporting information about the links for use by the system developer in determining potential memory leaks.

21. (Currently amended) The method of claim 15 wherein the objects are not moved in the memory when clustered.

22. (Currently amended) A system for detecting memory leaks in an application server or run-time environment, the system comprising:

a virtual machine executing within said run-time environment;

a memory ~~space~~ within said run-time environment for storing objects ~~in memory~~, for use by a software application; and[[,]]

a temperature analyzer that accepts as input from a system developer a value for a limiting time[[,]];

wherein the temperature analyzer determines for each object whether the object has persisted in the memory without being accessed or referenced for a length of time greater than the limiting time, wherein if the length of time Is greater than the limiting time, the object is marked as cold, and if the length of time is less than the limiting time, the object is marked as warm[[,]]; and

wherein the temperature analyzer determines links from any of the warm objects to any of the cold objects, for use by the system developer in detecting memory leaks.

28. (Currently amended) The system of claim 22 wherein the objects are not moved in the memory when clustered.

29. (Currently amended) A system for detecting memory leaks in an application server or run-time environment, the system comprising:

means for providing a virtual machine executing within said run-time environment;

a memory ~~means~~ for storing objects ~~in a memory~~, said objects for use by a software application;

means for accepting as input from a system developer a value for a limiting time:

means for determining for each object whether the object has persisted in the memory without being accessed or referenced for a length of time greater than the limiting time, wherein if the length of time is greater than the limiting time, marking the object as cold, and if the length of time is less than the limiting time, marking the object as warm; and

means for determining links from any of the warm objects to any of the cold objects, for use by the system developer in detecting memory leaks.

35. (Currently amended) The system of claim 29 wherein the objects are not moved in the memory when clustered.

36. (Currently amended) A method for detecting memory leaks in an application server or run-time environment, the method comprising the steps of:

providing a virtual machine executing within said run-time environment;

storing objects in a memory, for use by a software application;

accepting as input from a system developer a value for a limiting time:

determining for each object whether the object has persisted in the memory without being accessed or referenced for a length of time greater than the limiting time, wherein if the length of time is greater than the limiting time, marking the object as cold, and if the length of time is less than the limiting time, marking the object as warm; and

determining links from any of the warm objects to any of the cold objects, for use by the system developer in detecting memory leaks.

42. (Currently amended) The method of claim 36 wherein the objects are not moved in the memory when clustered.

43. (Currently amended) A system for providing potential memory leak information in a run-time environment, the system comprising:

a memory for storing objects;

an object temperature analyzer that accepts as input from a system developer a value for a limiting time, wherein the object temperature analyzer determines for each object whether the object has persisted in the memory without being accessed or referenced for a length of time greater than the limiting time, wherein if the length of time is greater than the limiting time the object temperature analyzer marks the object as cold, and if the length of time is less than the limiting time the object temperature analyzer marks the object as warm;

an object clusterer that clusters groups of warm objects to form warm clusters and groups of cold objects to form cold clusters; and

an object map that identifies links from any of the warm objects in any of the warm clusters to any of the cold objects in any of the cold clusters to assist the system developer in determining potential memory leaks.

48, (Currently amended) The system of claim 43 wherein the objects are not moved in the memory when clustered.

49. (Currently amended) A system for providing potential memory leak information in a run-time environment, the system comprising:

a memory for storing objects;

means for accepting as input from a system developer a value for a limiting time;

means for determining for each object whether the object has persisted in the memory without being accessed or referenced for a length of time greater than *the* limiting time, wherein if the length of time is greater than the limiting time the object temperature analyzer marks the object as cold, and if the length of time is less than the limiting time the object temperature analyzer marks the object as warm;

means for clustering groups of warm objects to form warm clusters and groups of cold objects to form cold clusters; and[[,]]

means for identifying links from any of the warm objects in any of the warm clusters to any of the cold objects in any of the cold clusters to assist the system developer in determining potential memory leaks.

54. (Currently amended) The system of claim 49 wherein the objects are not moved in the memory when clustered.

55. (Currently amended) A method for providing potential memory leak information in a run-time environment, the method comprising the steps of:

storing objects in a memory;

accepting as input from a system developer a value for a limiting time;

determining for each object whether the object has persisted in the memory without being accessed or referenced for a length of time greater than the limiting time, wherein if the length of time is greater than the limiting time the object temperature analyzer marks the object as cold, and if the length of time is less than the limiting time the object temperature analyzer marks the object as warm;

clustering groups of warm objects to form warm clusters and groups of cold objects to form cold clusters; and[[,]]

identifying links from any of the warm objects in any of the warm dusters to any of the cold objects in any of the cold clusters to assist the system developer in determining potential memory leaks.

60. (Currently amended) The method of claim 55 wherein the objects are not moved in the memory when clustered.

61. (Currently amended) A system for use in determining potential memory leaks in a run-time environment, said run-time environment including a virtual machine ~~and a memory space for storing objects~~, the system comprising:

a memory for storing objects;

objects located in the memory ~~of a run-time environment~~, wherein each object

includes a time stamp field and a time stamp therein, and wherein the time stamp is updated with a current system time T_{access} when the object is accessed or referenced;

an object temperature' analyzer that accepts as input from a system developer a value for a limiting time T_{limit}, wherein the object temperature analyzer after a time T_{check}, marks each object as warm if the length of time between T_{access} and T_{check} is less than the limiting time T_{limit} or marks the object as cold if the length of time between T_{access} and T_{check} is greater than the limiting time T_{limit};

an object clusterer that clusters groups warm objects to form warm clusters and groups cold objects to form cold clusters; and[[,]]

a display device that displays an object map, the object map including links from any of the warm objects in any of the warm clusters to any of the cold objects in any of the cold clusters.

65. (Currently amended) The system of claim 61 wherein the objects are not moved in the memory when clustered.

66. (Currently amended) A system for use in determining potential memory leaks in a run-time environment, said run-time environment including a virtual machine ~~and a memory space for storing objects~~, the system comprising:

means for creating objects in [[the]] a memory of [[a]] the run-time environment;

means for stamping each object with a time stamp T_{init} when created;

means for updating the time stamp of each object with a current system time T_{access} when the object is accessed or referenced;

means for accepting as input by a system developer a value for a limiting time T_{limit};

means for after a time T_{check}, marking each object as warm if the length of time between T_{access} and T_{check} is less than the limiting time T_{limit} or marking the object as cold if the length of time between T_{access} and T_{check} is greater than the limiting time T_{limit};

means for clustering groups of warm objects to form warm clusters and groups of cold objects to form cold clusters; and[[,]]

means for displaying an object map showing links from any of the warm objects in any of the warm clusters to any of the cold objects in any of the cold clusters.

70. (Currently amended) The system of claim 66 wherein the objects are not moved in the memory when clustered.

71. (Currently amended) A method for use in determining potential memory leaks in a run-time environment, said run-time environment including a virtual machine ~~and a memory space for storing objects~~, the method comprising:

creating objects in [[the]] a memory of [[a]] the run-time environment; stamping each object with a time stamp T_{init} when created;

updating the time stamp of each object with a current system time T_{access} when the object is accessed or referenced;

accepting as input by a system developer a value for a limiting time T_{limit};

after a time T_{check}, marking each object as warm if the length of time between T_{access} and T_{check}, is less than the limiting time T_{limit} or marking the object as cold if the length of time between T_{access} and T_{check} is greater than the limiting time T_{limit};

clustering groups of warm objects to form warm clusters and groups of cold objects to form cold clusters; and[[,]]

displaying an object map showing links from any of the warm objects in any of the warm clusters to any of the cold objects in any of the cold clusters.

75. (Currently amended) The method of claim 71 wherein the objects are not moved in the memory when clustered.

-end of currently amended claims-

8. The following is an examiner's statement of reasons for allowance:

The cited prior art taken alone or in combination fail to teach the limitation "wherein the object temperature analyzer determines for each object whether the object has persisted in the memory without being accessed or referenced for a length of time greater than the limiting time, wherein if the length of time is greater than the limiting time the object temperature analyzer sets the status of the object to cold, and if the length of time is less than the limiting time the object temperature analyzer

sets the status of the object to warm; and wherein the object temperature analyzer determines links from any of the warm objects to any of the cold objects; and a report mechanism that reports information about the links, for use by the system developer in determining potential memory leaks" as recited in independent claims 1, 8, 15, 22, 29, 36, 43, 49, 55, 61, 66, and 71.

The closest cited prior arts, "FAST LIFETIME ANALYSIS OF OBJECTS IN A GRABAGE-COLLECTED SYSTEM", by Wolczko et al. (USPGPub. No. 2003/0191783), teaches a method of dynamically the analysis of the lifetime of objects in a garbage-collected system.. It does not specifically disclose at least the limitation of "where in the object temperature analyzer determines links from any of the warm objects to any of the cold objects; and, a report mechanism that reports information about the links, for use by the developer in determining potential memory leaks."

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Philip Wang whose telephone number is 571-272-5934. The examiner can normally be reached on Mon - Fri 8 - 44:00PM. Any inquiry of general nature or relating to the status of this application should be directed to the TC2100 Group receptionist: 571-272-2100.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wei Zhen can be reached on 571-272-3708. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

WEI ZHEN
SUPERVISORY PATENT EXAMINER